

REMARKS

Amendments

Claim 1 is amended to recite that the phthalocyanine complex is a complex of iron or cobalt. Claims 2 and 4 are amended to make minor changes in punctuation.

New claims 6-21 are directed to further aspects of the claimed invention and are supported throughout the disclosure. See, e.g., original claims, page 4, line 24 – page 5, line 2, page 5, lines 6-17, page 5, line 20 – page 7, line 12, page 8, line 7-10, page 8, line 20 – page 9, line 25, and the Examples.

Related Application

The instant application is related to Application Serial No. 11/216,066, filed September 1, 2005. Claim 1 of Application Serial No. 11/216,066 reads as follows:

A flame retardant composition comprising:

(a) a brominated flame retardant having a bromine content greater than 50% by weight;

(b) a free-radical generator which is 2,3-dimethyl-2,3-diphenylbutane, 3,4-dimethyl-3,4-diphenylhexane, 4,5-dimethyl-4,5-diphenyloctane, 3,4-diethyl-3,4-diphenylhexane, 4,5-diethyl-4,5-diphenyloctane, 2,3-dimethyl-2,3-di-p-tolylbutane or 3,4-dimethyl-3,4-di-p-tolylhexane; and

(c) a phthalocyanine or a naphthalocyanine complex with a metal, wherein said metal is Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd or Pt;

wherein the weight ratio (b):(c) is from 99:1 to 1:99 and the sum (b) + (c) is from 0.01 to 50 parts by weight per 100 parts by weight of (a).

Claim 8 is a similar independent claim and recites a flammable plastic material in addition to the other compounds recited in claim 1.

Claims 1 and 8 in Application Serial No. 11/216,066 are presently rejected as allegedly being obvious in view of Muehlbach et al. (US 5,124,391) in combination with Langley et al. (US 3,775,149). Sanyasi (US 5,753,717) and Amtmann et al. (US 4,027,080) are combined with Muehlbach et al. (US 5,124,391) and Langley et al. in other prior art rejections of dependent claims under 35 USC 103(a).

Rejection under 35 USC 103(a)

Claims 1-5 are rejected as allegedly being obvious in view of Parts et al. (US 3,825,520). This rejection is respectfully traversed.

Parts et al. (US '520) disclose the use of iron, copper, manganese, vanadium, and cobalt phthalocyanine complexes as smoke retardants in styrene polymer compositions. The amounts of these phthalocyanine complexes used by Parts et al. are relatively high. See, e.g., Tables I and II wherein the amount of the phthalocyanine complexes in a polystyrene polymer and ABS polymer is 22.7-28.4 wt.%. With the polystyrene polymer or ABS polymer making up the rest of the composition, this would result in the compositions having 29.4 to 39.7 parts by weight of phthalocyanine complex per 100 parts by weight polymer.

Compare applicants' claim 1, wherein the amount of phthalocyanine complex of iron or cobalt is 0.01 to 0.2 parts by weight per 100 parts by weight of the resin (A).

Parts et al. also disclose using phthalocyanine complexes as smoke retardants in styrene plastic compositions that contain flame retardant agents, specifically the brominated agent octabromobiphenyl or the phosphorus agent $(C_6H_5O)_3PO$. See Tables III and IV.

The amount of the brominated agent is approximately the same as the amount of phthalocyanine complex. In Table III, the 1st example contains only ABS polymer, and the 2nd examples contains only ABS polymer and the brominated agent octabromobiphenyl. However, the 3rd and 4th examples in Table III contain polymer, brominated agent and phthalocyanine complex.

In the 3rd example, the amount of octabromobiphenyl is 24.4 wt. % and the amount of Fe phthalocyanine is 25.4 wt. %, resulting in the ABS polymer being present in an amount of 50.2%. Thus, the composition of this example contains 50.6 parts Fe phthalocyanine per 100 parts by weight of polymer, and 48.6 parts brominated agent per 100 parts by weight of polymer.

In the 4th example in Table III, the amount of octabromobiphenyl is 24.4 wt. % and the amount of V phthalocyanine is 28.4 wt. %. As a result, the amount of ABS polymer in the composition is of 47.2%. Thus, the composition of this example contains 60.2 parts V phthalocyanine per 100 parts by weight of polymer, and 51.2 parts brominated agent per 100 parts by weight of polymer.

The compositions of the 2nd and 3rd examples in Table IV are the same as the compositions of the 3rd and 4th examples in Table III, respectively.

Thus, in all the examples disclosed by Parts et al. that contain polymer, phthalocyanine complex, and brominated agent, the amount of brominated agent is 48.6 or 51.2 parts by weight per 100 parts by weight of polymer, and the amount of phthalocyanine complex is 50.6 or 60.2 parts by weight per 100 parts by weight of polymer. Compare applicants' claim 1 wherein the amount of brominated flame retardant is 0.1 to 30 parts by weight per 100 parts by weight of the resin, and the amount of phthalocyanine complex is 0.01 to 0.2 parts by weight per 100 parts by weight of the resin.

In the rejection, it is alleged that the "proportions of components as taught [by Parts et al.] overlap those claimed." This is incorrect. Parts et al. provide no general ranges for the amounts of polymer, phthalocyanine complex, and brominated agent in a composition containing all three components. Moreover, as explained above, the examples of Parts et al. provide no suggestion of phthalocyanine complex and/or brominated agent in amounts within the ranges recited in applicants' claims.

Turning again to the disclosure of Parts et al., the results shown in Table III, the addition of the phthalocyanine complex reduced the amount of smoke and increased the combustion residue, in comparison to just the octabromobiphenyl alone. On the other and, the addition of the phthalocyanine complex increased the burning time in comparison to the use of octabromobiphenyl alone.

In Table IV, the addition of the phthalocyanine complexes increased the flammability of the flame retardant polymer compositions containing octabromobiphenyl. In the case of Fe phthalocyanine, the increase in flammability was significant, changing a self-extinguishing polymer composition into a not-self extinguishing polymer composition.

Contrary to the assertion in the rejection, the disclosure of Parts et al. does not render obvious applicants' claimed invention. Parts et al. provide no suggestion of the amounts recited in applicants' claims. For example, only examples in Table III and IV of Parts et al. use both a brominated flame retardant agent and a phthalocyanine complex. The amount of these two agents used in the polymer is roughly equivalent, and the amounts are relatively high. Parts et al. provide no suggestion of varying the amounts of these agents so as to arrive at an embodiment in accordance with applicants' claimed invention.

In view of the above remarks, it is respectfully submitted that Parts et al. (US 3,825,520), fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

To further emphasize the non-obvious character of applicants' claimed invention, enclosed herewith is a Rule 132 Declaration by Hideaki Onishi (one of the inventors of the instant application) comparing a composition in accordance with the claimed invention with another composition having a higher content of phthalocyanine complex.

In the Declaration, composition A contains 100 parts resin, 20 parts brominated flame retardant, **0.05 parts** Fe phthalocyanine, 0.2 parts heat stabilizer, and 5 parts antimony trioxide. Composition B, on the other hand, contains 100 parts resin, 20 parts brominated flame retardant, **42.7 parts** Fe phthalocyanine, 0.2 parts heat stabilizer, and 5 parts antimony trioxide.

As shown in the Declaration, the increased amount of Fe phthalocyanine in composition B produced specimens that had a significantly lower flexural strength, i.e., 19 versus 40 for the specimens produced from composition A. In addition, the increased amount of Fe phthalocyanine significantly adversely affected flame retardancy (the specimens from composition B exhibited a very long glowing combustion period which was impermissible under the specified test).

In view of the above remarks, it is again respectfully submitted that Parts et al. (US 3,825,520), fails to render obvious applicants' claimed invention. Withdrawal of the rejection is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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